

negative shadow in the midst of the denser one shewed a pathological condition, so leading to operation and a solution.

Radiography cannot show a calculus that is not opaque to X-rays, but if a contrast medium giving a dense shadow, in this case, sodium iodide 12½ per cent., be used, the stone will almost certainly give a negative shadow.

HYPER VENTILATION TETANY ✓

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TETANY is by no means a common condition, and of its several causes, over-ventilation of the lungs probably is the rarest. Two such cases occurred in the Royal Victoria Hospital within a few months of each other, and so it seems worth while putting them on record. One of them was already referred to some time ago in the Ulster Medical Society by Professor Thomson, in connection with a discussion on alkalosis, but the hyper ventilation was not stressed at the time.

1. The first case was a girl of 20, a probationer nurse in a mental hospital. For four days she had had some pain in her back, especially when she took a deep breath, but suddenly the pain became worse and she collapsed and lost consciousness. She recovered in about fifteen minutes, and then it was noticed that her respirations were very fast. Within a few hours she was complaining of "pins and needles" in her hands and feet, and suddenly they became stiff. On examination she was found to have typical carpo-pedal spasms. Spasms were frequent and lasted about five minutes each, until she was admitted to the Royal Victoria Hospital some hours later. By that time she no longer had open tetany, but she had spasm of the face muscles when the facial nerve was tapped, and constriction round an arm or a leg produced a carpal or a pedal spasm. Except for some tenderness in the right costo-vertebral angle, there was no abnormality found on physical examination. Her temperature was 97.4°F. and her pulse 60. Her respiration rate was forty-eight per minute.

Dr. McCoy was good enough to do her alveolar carbon dioxide at once, and found it to be 3.2 per cent.—about half the normal. She had a normal blood calcium of 8.9 mgm. per cent.

The following day while being examined she again had spontaneous carpo-pedal spasms. She was treated with oral ammonium chloride. The respiration rate gradually returned to normal, and there were no more signs of tetany.

She had never seen a case of tetany herself.

2. The second case was an unemployed girl of 22.

Ten months previously she had had pleurisy and had been in the Belfast Union Infirmary. She came to the medical extern at the Royal Victoria Hospital complaining that the old pain that she had had at the time of the pleurisy had returned, that for several days she had been having almost continuous headaches, that she felt sick, and was vomiting almost everything she ate. She also complained of excessive sweating.

She did not look ill, but was panting for breath—her respiration rate was at one time as high as sixty per minute.

Her pulse was 90 and her temperature 97.0°F.

Nothing abnormal was found on examination, and X-ray confirmed the absence of any lesion in her lungs.

She had some twitching of her right shoulder.

There was no manifest tetany, but on tapping the facial nerve, spasm of the face-muscles was produced, especially at the corners of the mouth. Carpo-pedal spasms could not be produced by constrictions round the limbs. She was excreting an alkaline urine.

After a day or two in hospital her symptoms cleared up.

In neither of these cases was any organic basis found for the hyper ventilation, and so the primary lesion must be regarded as functional. Such a psycho-neurosis and post-lethargic encephalitis are generally given as the most common causes of over-breathing.

The resulting biochemical disturbance seems to be something like this :—

The reaction of the blood depends on the ratio

$$\frac{\text{H}_2\text{CO}_3}{\text{NaHCO}_3}$$

With over-ventilation the numerator is reduced, and leaves a relative alkalosis with the loss of carbon dioxide from the blood. To correct this, some of the sodium bicarbonate is redistributed in an attempt to restore the original ratio. This does not bring about complete compensation, and so there is alkalosis, although the alkali reserve has been lowered. To help to keep the blood pH correct, the kidney secretes a less-acid or, as in the second case, an alkaline urine.

Disturbance in estimated blood-calcium is not a feature in this type of tetany, though there may be a disturbance in ionisation.

While the respirations are fast they are very shallow, so that the fall in blood carbonic acid is not enough to cause apnœa.

In the first of these two cases the alkalosis was expressed in terms of open tetany. In the second case headache, nausea, and vomiting were marked, while the tetany was latent.

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TWO CASES OF CHRONIC HÆMOLYTIC ANÆMIA

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THE essential criteria of a "hæmolytic anæmia" are as follows :—

- (1) A progressive anæmia.
- (2) An increase in the plasma bilirubin and in the urinary urobilin.